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POLICY PAPER

**Barriers to Sub-Saharan Countries Issuing
Sovereign Green Bonds and How to
Overcome Them: Insights from Nigeria and
Seychelles**

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Abstract

The Sub-Saharan African (SSA) countries are disproportionately at risk of experiencing severe environmental and socio-economic consequences of global warming. Although many countries in the region have demonstrated their commitment to mitigating and adapting to climate change by ratifying the Paris Agreement and submitting their nationally determined contributions (NDCs), public resources alone are insufficient to meet the targets outlined in these plans. Sovereign green bonds (SGBs) represent a viable tool to address these financial gaps. By issuing them SSA countries can finance NDC-related projects, mobilise capital and enhance their resilience to climate change. Despite their potential, SSA countries face significant barriers to issuing SGBs. To date, only two countries in the region – Nigeria and Seychelles – have successfully issued such bonds. This paper identifies the obstacles to issuing SGBs and distinguishes between market and institutional barriers. By analysing case studies of Nigeria and Seychelles, the paper explores how these countries overcame the challenges and the strategies they employed. The comparative analysis reveals that SSA countries need to meet three prerequisites to successfully issue SGBs: international partnerships with organisations that provide training and expertise; donor-funded transaction cost coverage; and manageable debt levels coupled with low sovereign risk. Based on these findings, the paper provides actionable policy recommendations for SSA countries either through a public issuance denominated in the local currency (as in the case of Nigeria) or through a private deal (as in the case of Seychelles) with bonds denominated in a foreign currency, depending on their features. Finally, the paper suggests that EU development financial institutions should address specific barriers that have historically hindered sovereign green bond issuances in the region by supporting the establishment of robust climate and environmental policies, thus providing financial support to offset transaction costs and offering advice tailored to each country's capital market conditions and risk-return profile.

Keywords

climate finance, green bonds, barriers, Sub-Saharan Africa, Nigeria, Seychelles, Global Green Bond Initiative

Introduction

The severity and frequency of climate change-related disasters are on the rise and they affect the lives of millions around the globe. With 2024 set to be the hottest year on record, it was also marked by floods in East Africa, the Sahel and Europe, drought in the American continent and the south of Africa, and heatwaves worldwide (United Nations Office for the Coordination of Humanitarian Affairs, 2024).

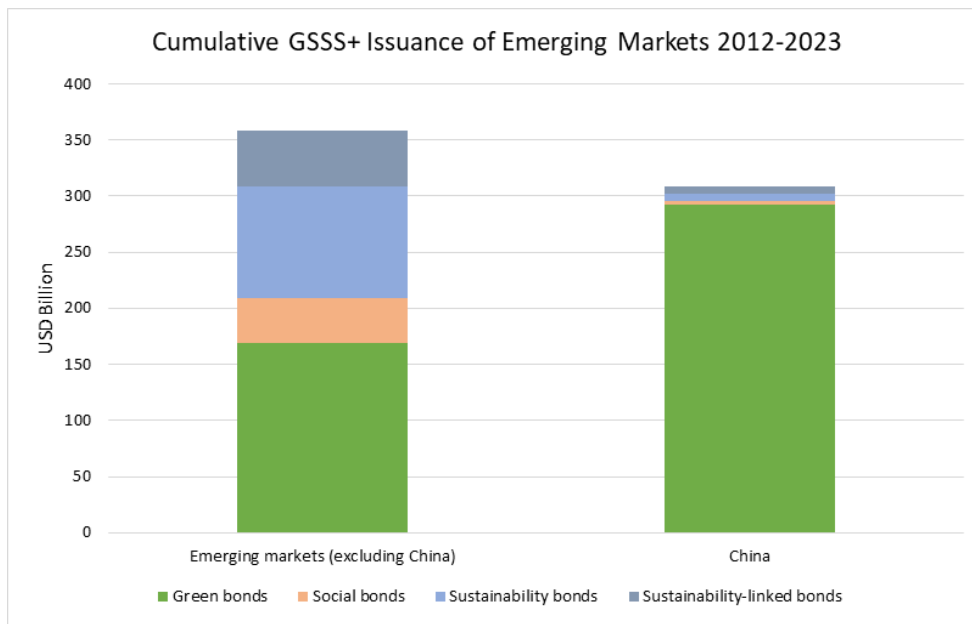
Sub-Saharan African (SSA) countries are at greater risk of suffering from the consequences of global warming (World Meteorological Organisation, 2024). In 2019, two tropical cyclones – both generated by higher than usual sea water temperatures – hit three SSA nations (United Nations Office for the Coordination of Humanitarian Affairs, 2019). Subsequently, in 2020-2021 an unprecedented locust swarm devastated extensive agricultural areas across the Horn of Africa, specifically affecting Ethiopia, Somalia and Kenya, and exacerbated food security concerns during the global COVID-19 pandemic (International Federation of Red Cross and Red Crescent Societies, 2022). Variability of precipitation poses a substantial threat to agricultural productivity, particularly considering that the majority of African agricultural operations consist of smallholder farms, with approximately 95% of the continent's agriculture depending on rainfall rather than irrigation systems (Guido et al., 2020). The resulting diminished yield of key export commodities such as tea, coffee, cocoa, cotton, cut flowers and nuts potentially translates into reduced export revenue, and consequently a loss of GDP.

The forecast socio-economic consequences are dire too. Studies have increasingly shown that the negative impact of climate change on access to natural resources can drive conflict and disparities in accessing essential social services (Navone, 2021). At the same time, persistent development challenges (e.g. degraded ecosystems, lack of infrastructure, limited access to technological and financial resources) undermine the region's capacity to adapt and mitigate the effects of climate change.

While SSA nations have demonstrated their commitment to climate action through widespread ratification of the Paris Agreement and submission of their nationally determined contributions (NDCs), which could substantially enhance climate resilience across the continent, the domestic public resources allocated remain insufficient for comprehensive implementation. Consequently, SSA governments need to mobilise both local and international capital to address this funding deficit. In this context, climate finance instruments, especially sovereign green bonds, can play a key role.

The use of green bonds would expand the range of solutions available to increase public funds to achieve NDC targets in a convenient way because, as Standing (2023, p. 25) argues, "they offer the chance to raise large sums from capital markets within a relatively short time, with the responsibility for fully repaying this debt delayed for at least 10 years."

Table I: Data from International Finance Corporation and Amundi, Emerging Market Green Bonds, May 2024



On a global scale, emerging economies have increasingly utilised environmental, social and governance (ESG) bonds as financial instruments to mobilise capital. In 2012-2023 the cumulative amount of green, social, sustainability and sustainability-linked (GSSS) bonds issued in emerging economies by both public and private actors (excluding China) reached USD 363 billion (10% of the global cumulative total of USD 4.9 trillion). Of this USD 169 billion (47%) were green bonds (Table I) (International Finance Corporation and Amundi, 2024). While the SSA green bond market has progressively developed in recent years, it still lags far behind those of other regions (Table II).

Table 2: Data from International Finance Corporation and Amundi, Emerging Market Green Bonds, May 2024

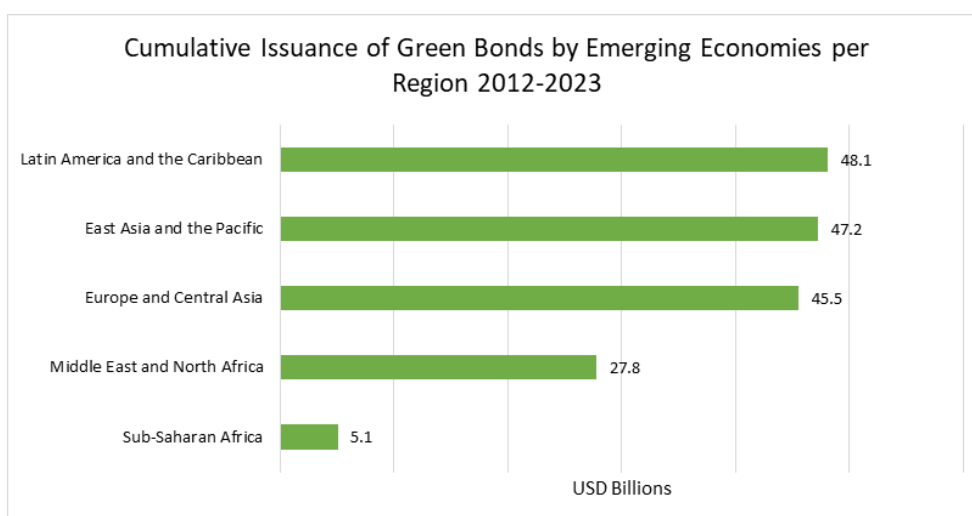


Table II: Data from International Finance Corporation and Amundi, Emerging Market Green Bonds, May 2024

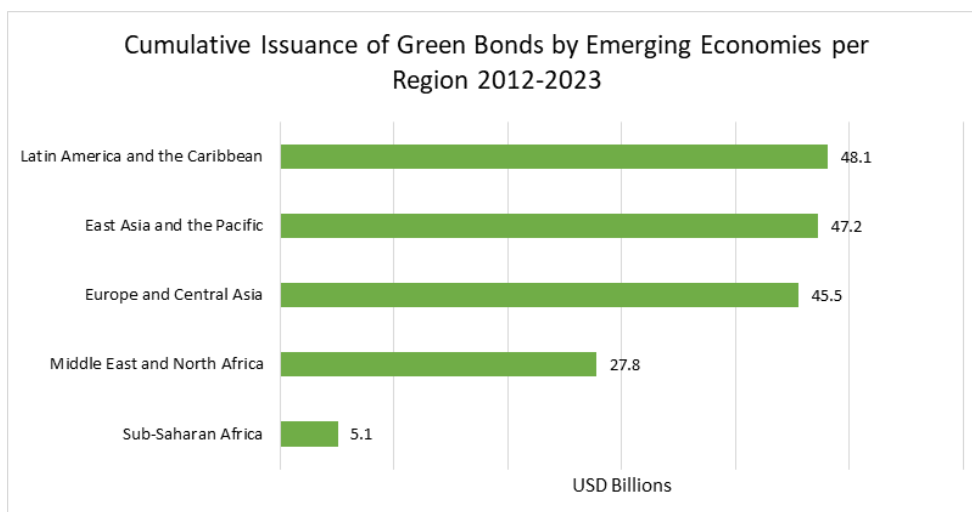
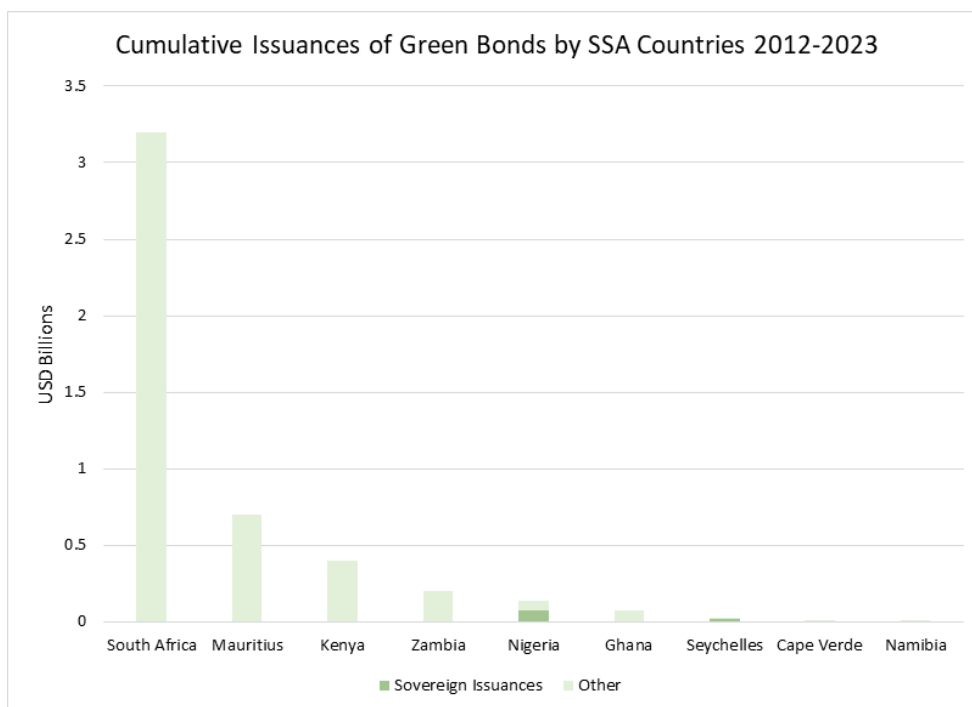


Table III: Data from International Finance Corporation and Amundi, Emerging Market Green Bonds, May 2024



In 2012-2023 in SSA, issuances of green bonds took place in South Africa (USD 3.2 billion), Mauritius (USD 0.7 billion), Kenya (USD 0.4 billion), Zambia (USD 0.2 billion), Nigeria (USD 0.14 billion), Ghana (USD 0.07 billion), Seychelles (USD 0.02 billion), Cape Verde (USD 0.004 billion) and Namibia (USD 0.004 billion) for a total cumulative amount of USD 4.7 billion (Climate Bonds Initiative, 2024). Sovereign issuances only took place in Nigeria (2 issuances, a total of USD 71 million) and Seychelles (1 issuance, USD 15 million). Only 2 of the 49 states composing the SSA region have issued sovereign green bonds so far (Table III) (International Finance Corporation and Amundi, 2024).

Given the insufficiency of public funding and the contraction of development finance, green bonds emerge as a viable tool for these countries to raise more funds to implement their NDCs. However, evidence suggests the existence of specific barriers that prevent SSA countries from easily issuing sovereign green bonds. The aim of this paper is to identify these barriers and analyse how Nigeria and Seychelles have overcome them while also evaluating which barriers proved less significant than anticipated in practice.

In the first part of the paper, I describe the market and the institutional barriers that SSA countries face if they want to issue sovereign green bonds. The second part of the paper explores how Nigeria and Seychelles dealt with these barriers. Finally, after a comparative analysis of the two case studies, the paper provides policy recommendations for both the SSA countries and the European Union (EU) in the light of its newly launched Global Green Bond Initiative.

1. Market barriers

1.1 A lack of local demand

One significant challenge identified in the literature is a limited demand for green bonds among local investors in SSA countries.

Most of the institutional investors in the region have not yet aligned their mandates with sustainability criteria, primarily due to a low level of awareness of the potential of green assets and projects. This knowledge gap stems from limited resources being available for data collection and the analysis necessary to make informed decisions about sustainable finance products (Babon-Ayeng et al., 2022). Practitioners in Kenya's capital markets echo this concern and identify weak demand for green products as the most challenging bottleneck (Magale, 2021).

For retail investors, the risk-return profile of an issuance still represents the main investment driver. Even in South Africa, the region's most advanced market, only 28% of investors surveyed would incorporate green bonds in their portfolios if they were available, signalling a weak drive for responsible investing (Dave and Akongwale, 2024). In addition, many local financial institutions exhibit risk-averse behaviour and face capacity constraints. These factors, coupled with a lack of robust sustainability strategies, make green issuances less attractive and the added value of the green label overlooked.

1.2 Features of the capital markets

While local demand for green products remains limited, international investors exhibit relatively strong interest in green bonds issued by emerging markets and developing economies (International Finance Corporation and Amundi, 2024). However, the underdeveloped nature of capital markets in SSA countries significantly reduces their attractiveness to international investors (Chugan et al., 2017).

SSA financial markets are characterised by weak regulatory frameworks (Stockholm Environment Institute, 2020). Unreliable legal and regulatory systems undermine the growth of a green bond market since these bonds require specific accountability and compliance measures for the use of proceeds, impact reporting and other environmental standards. If international standards and best practices are not met, the risk of greenwashing increases, which discourages international investors.

In addition, the region lacks the essential financial infrastructure required to scale up nascent markets (e.g. trading platforms, clearing houses, custodians, fiduciaries), which hampers the development of depth and liquidity of the green bond market. Furthermore, the absence of complementary supporting initiatives – such as robust taxation and accounting frameworks, effective legislative enforcement, creditor right protections and comprehensive bankruptcy and competition laws – further diminishes investor confidence and participation (International Finance Corporation and Amundi, 2021).

1.3 Transaction costs

To attract investors and comply with international standards, issuers are required to demonstrate the environmental credentials of their bonds. This process involves additional expenses compared to conventional bond issuance during the structuring, certification and issuance phases. Hachenberg and Schiereck (2018) estimate that transaction costs for a USD 500 million green bond issuance range between USD 1.5 million and 3 million. Nevertheless, smaller issuances also incur substantial transaction costs, as significant efforts are required for monitoring, disclosure and impact reporting to meet international standards (Kaminker et al., 2018).

The most significant expenses are attributed to external reviewers, who certify the environmental integrity of bonds and evaluate the impact of the proceeds. According to the International Monetary Fund, assessments of sovereign ESG bonds can cost up to USD 100,000 (Standing, 2023). SSA countries cannot rely on local external reviewers. Even if they were present in the region, they would be unlikely to gain the same recognition as the most important international organisations providing this service, such as CICERO, Sustainalytics and Vigeo Eiris. However, reliance on these companies increases the cost of the external review.

Consequently, the transaction costs associated with both pre-issuance and post-issuance activities represent a major obstacle for SSA countries, which often operate with constrained financial resources.

1.4 The risk-return profile

The results of a survey of 21 local, European and US investors and advisors operating on the Johannesburg Stock Exchange show competitive pricing as the primary factor influencing their decisions to invest in sustainable products (Dave and Akongwale, 2024). However, potential SSA issuers face challenges in issuing green bonds with risk-return profiles that meet investors' expectations.

First, green projects are inherently riskier than conventional ones because “innovations happening in the sustainability space have no historical record, making investors question their commercial viability” (Dikau et al., 2022, p.220). Second, sustainable finance products present a liquidity risk and challenges in pooling and securitisation in secondary markets due to the relatively modest size of the projects typical of emerging economies (Wambui, 2022). Furthermore, additional risk considerations are added by the complexity of the due diligence processes required to verify compliance with green metrics in jurisdictions characterised by weak governance frameworks (Wambui, 2022). Moreover, while SSA issuers may enhance investor attraction with international currency denominations (predominantly Renminbi, USD or EUR), this strategy introduces currency risk exposure for both creditors and debtors, given that project revenue streams are typically denominated in local currencies (Flaherty et al., 2017).

Consequently, the risk factors inherent in green bond issuances by emerging economies are further amplified by the distinctive characteristics of the SSA nations, which substantially constrain the capacity of issuers to establish competitive pricing in the green bond market.

2. Institutional barriers

2.1 Institutional arrangements

When evaluating sovereign green bond investments, the credit ratings of issuing entities assume critical significance for investors as they serve both as safeguards against greenwashing practices and as indicators of resilience during market volatility (Dave and Akongwale, 2024). Investment decisions are favourably influenced by institutional robustness and transparency, sophisticated monitoring and evaluation frameworks ensuring adherence to green standards and sufficient rule of law provisions to maintain investment continuity during political transitions (Babon-Ayeng et al., 2022).

SSA debt management offices (DMOs), which usually manage the proceeds of sovereign green bond issuances, are unlikely to ensure the required transparency given the lack of disclosure and the scarcity of data on the environmental impact of investments (World Bank, 2022). The establishment of effective monitoring and evaluation systems is constrained by human capital and technical resource deficiencies in these DMOs. Furthermore, SSA markets face substantial challenges in establishing precise and concise green qualification criteria. The absence of specific taxonomies impedes green bond issuances, identification and investment processes, while simultaneously presenting challenges to stock exchanges in facilitating transactions (International Finance Corporation and Amundi, 2020).

Moreover, SSA countries face governance challenges such as public expenditure inefficiencies, corruption-related issues and limitations in administrative and regulatory oversight capacities. The reliability of institutional checks and balances systems is frequently compromised and is accompanied by deficiencies in accountability and transparency mechanisms (World Bank, 2024). Governance structures are often influenced by exclusive elite arrangements, which potentially undermine rule-based governance and consequentially affect economic activities. This institutional environment leads to policy volatility, compromises the management of budgets and complicates long-term planning (World Bank, 2024). These conditions undermine the consistent enforcement of processes needed to support green bonds and potentially affect the confidence of investors.

2.2 A lack of strong pipelines of meaningfully sized projects

SSA countries need to present a substantial and visible pipeline of sustainability-aligned investment opportunities of sufficient scale to mobilise international capital (World Bank, 2022). This is because bond market dynamics establish significant minimum threshold requirements: investors typically require minimum liquidity equivalent to USD 200 million, while prominent rating agencies, such as Moody's, do not consider any project that is worth below USD 250 million (Oche, 2020). Consequently, green bond issuances must achieve critical mass, typically ranging between USD 300 and 500 million, to ensure market viability (Deschryver and de Mariz, 2020)

However, public sector capacity in SSA nations often lacks data and metrics that are necessary to prepare and design green projects and the technical capabilities to implement them. Furthermore, the absence of clearly articulated investment-ready opportunities in their NDCs hinders project origination and scalability, thus resulting in a limited pool of projects meeting the bankability criteria of investors (Wambui, 2022). The disparity between market expectations and the verified green assets available in SSA is remarkable: typically, project values range between USD 5 and 10 million (World Bank, 2022). With a value substantially below market requirements, international investors and intermediary financial institutions are less likely to invest in a project because of research and liquidity constraints.

2.3 A lack of incentives

Research indicates that investor engagement is significantly influenced by the presence of fiscal incentives and subsidies in green bond market development (Dave and Akongwale, 2024). Green projects often need public support since they are economically less attractive than traditional projects because of their inherent features. Even small changes to the cost of capital play a significant role in crowding in investors.

The majority of SSA nations have yet to establish comprehensive strategic frameworks to prioritise environmentally sustainable projects, including ones aligned with their NDCs (African Development Bank Group, 2018). There is a notable absence of institutional mechanisms designed to address the elevated capital costs associated with low-carbon and climate-resilient infrastructure investments, which are characteristically capital-intensive (Maltais and Nykvist, 2020). Establishing which projects prioritise and are eligible for public support presents significant challenges to SSA governments and institutions, which are characterised by systemic issues of corruption, extractive practices and clientelist relationships. Therefore, the uncertainty linked to the preparation and prioritisation of green development, coupled with the lack of any incentive, undermines the appetite of investors for green bonds issued in the region.

2.4 The debt situation

Green bond pricing mechanisms demonstrate a strong correlation with conventional government debt instruments, as investor pricing strategies are based on assessments of the sovereign risk. Therefore, “the level and nature of the sovereign’s debt determine the amount, tenor, currency, frequency of issuance, calendar and maturity profiles of the green bond issuance” (Levine, 2018, p. 13).

The fact that the price of sovereign green bonds is influenced by the level of indebtedness constitutes a great barrier for SSA countries, the debt situation of which has deteriorated considerably in recent years. The average public debt as a ratio of gross domestic product (GDP) in the region notably increased from an average of about 50% in 2019 to 60% in 2024, with a third of the countries experiencing debt levels above 70% of GDP (International Monetary Fund, 2023). Half the low-income countries in the region are currently experiencing either debt distress or high debt risk, which negatively impacts market sentiment and credit ratings while constraining fiscal capacity for green bond issuance. In particular, “SSA’s sovereign spreads increased three-times the emerging markets average since the global tightening cycle started” (Were, 2024, p.1).

The sustainability of 'sustainable' debt instruments may be further amplified in green bond markets by substantial international investment demand, particularly from European and North American asset managers. While this feature is usually considered an opportunity for a greenium, a more likely outcome is to encourage sovereign issuers to increase the value of the bond or return to the market with subsequent issues which worsen their debt situation. This risk is exemplified by Egypt's sovereign green bond experience, in which initial plans for a USD 500 million issuance attracted a USD 4.93 billion order book, which prompted a 50% increase in bond value to USD 750 million, effectively negating potential interest rate benefits through excessive borrowing (Standing, 2023). Furthermore, the completion of green projects might not stimulate economic growth or increase direct government revenue to the extent predicted. While many green projects would allow governments to achieve positive and NDC-related targets, they do not necessarily justify borrowing through international capital markets at high interest rates.

Therefore, given the likelihood of default, the high sovereign risk of SSA countries has the effect of crowding out private credit for sustainable projects.

3. Case Study: Nigeria

3.1 Introduction

Nigeria was the first SSA country to issue a sovereign green bond. In 2017 the first issuance, worth NGN 10.69 billion (USD 29 million), took place, and in June 2019 a second one followed of NGN 15 billion (USD 42 million).

3.2 A lack of local demand

To overcome the widespread unawareness of green bonds and sustainable finance more generally, the Nigerian authorities implemented comprehensive stakeholder engagement initiatives with strategic partnerships with non-governmental organisations, the World Bank and the FMDQ Group (a securities exchange consortium). This collaborative framework facilitated specialised training and capacity development programmes for Nigerian financial market participants and operators. The programme was launched in 2017 and proved highly successful. 73% of the first green bond issuance that took place in 2017 was subscribed by local pension fund administrators (Adejojo, 2022; FSDAfrica, et al., 2022). The following issuance that took place in 2019 was oversubscribed by retail investors, indicating greater financial inclusion and deepening of the domestic financial market, which reflected increased investor comprehension of green bond instruments (Udo, 2019). While overcoming this knowledge barrier required time and the establishment of international partnerships for the spreading of knowledge, these initiatives proved instrumental in expanding the sovereign green bond investor base.

3.3 Features of the capital market

Prior to the inaugural sovereign green bond issuance in 2017, despite maintaining one of the continent's highest market capitalisations, Nigerian capital markets exhibited significant development constraints. According to analysts, the Nigerian legal framework featured many exploitable loopholes to evade liability. This was the main reason behind the weak operational efficiency of the market and the presumed low confidence displayed by potential investors (Nwoke and Onoh, 2022). Notwithstanding these structural limitations, with support from international organisations and non-governmental entities the government established comprehensive national guidelines for the issuance of sovereign green bonds to ensure the proceeds aligned with its NDC objectives.

3.4 Transaction cost

According to FSDAfrica documentation, the technical and administrative budget allocations for Nigeria’s sovereign green bond issuances were USD 345,000 and USD 1.38 million for the first and second issuances respectively. The transactions incorporated external validation through second-party opinions, with DNV GL assessing the first issuance and Moody’s evaluating the second. While transaction costs were a substantial impediment for the Nigerian government, these administrative and technical expenditures were ultimately underwritten by FSDAfrica, a specialised development agency primarily supported by UK Aid funding (FSDAfrica et al., 2022).

3.5 The risk return profile

To understand whether investors perceive green bonds as riskier than sovereign vanilla bonds with similar characteristics issued during the same period, I compared the yield to maturity (YTM) of the sovereign green bond issued in December 2017 with the YTM of a sovereign vanilla bond issued by Nigeria in the same timeframe. To calculate the YTM, I relied on the Excel YIELD function with the following arguments: settlement, maturity, rate, price, redemption, frequency and basis (optional) (Microsoft, 2024).

Table IV: Comparison between the YTM of the Nigeria sovereign green bond and the federal government of Nigeria bond both issued in December 2017

	Nigeria sovereign green bond 2017 (Debt Management Office Nigeria, 2017)	Federal government of Nigeria bond 2017 (Debt Management Office Nigeria, 2017)
Settlement date	22 Dec 17	15 Dec 17
Maturity date	22 Dec 22	15 Jul 21
Coupon percentage	13.48%	14.50%
Price	NGN 1,000.00	NGN 1,000.00
Redemption value	NGN 1,000.00	NGN 1,000.00
Frequency	2	2
YTM	0.01348	0.014498954

The same YTM Excel function was used to calculate and compare the YTM of Nigeria sovereign green bonds issued in June 2019 with Federal government of Nigeria savings bonds with the most similar characteristics.

Table V: Comparison between the YTM of the Nigeria sovereign green bond and the federal government of Nigeria savings bond both issued in June 2019.

	Nigeria sovereign green bond 2019 (Debt Management Office Nigeria, 2019)	Federal government of Nigeria savings bond 2019 (Debt Management Office Nigeria, 2019)
Settlement date	13 Jun 19	28 Jun 19
Maturity date	13 Jun 26	28 Jun 23
Coupon percentage	14.45%	12.75%
Price	NGN 1,000.00	NGN 1,000.00
Redemption value	NGN 1,000.00	NGN 1,000.00
Frequency	2	2
YTM	0.01445	0.01275

The yield to maturity (YTM) of Nigeria's sovereign green bond issued in December 2017 was approximately 1.348%, compared to a contemporaneous vanilla bond YTM of 1.4498954% (Table IV). The June 2019 seven-year sovereign green bond had a YTM of approximately 1.445%, which exceeded the YTM of 1.275% of the four-year vanilla bond issued in June 2019 by 0.17% (Table V). While there were some variations in yields, Nigerian sovereign green bonds and vanilla bonds issued during the same period and with similar features were priced similarly overall. This suggests that the market did not significantly penalise green bonds for additional risks. Furthermore, the oversubscription of both green issuances (Adejo, 2022; FSD Africa et al., 2022; Petrova, 2018) supports the idea of a market perception of an appropriate risk-return calibration.

3.6 Institutional arrangements

According to Global Competitiveness Index metrics, Nigeria's institutional framework exhibited significant challenges in 2017-2019, particularly in the areas of corruption, judicial independence, government spending efficiency and future orientation. These institutional deficiencies, which are characteristic of SSA nations, significantly influenced the country's financial outlook (Schwab and Sala-i-Martin, 2017; Schwab, 2019). Furthermore, the Nigerian DMO had never issued green bonds before 2017. Therefore, the management of the process was completely unfamiliar.

Nonetheless, the Nigerian government established investor confidence with robust climate and environmental policy frameworks and green bond management structures. Even before adopting the first NDC in 2015, the country had established two policy frameworks to increase its climate resilience, namely Vision 20:2020 and the Transformation Agenda 2011-2015. Moreover, in 2012, the country had released the Nigeria Climate Change Policy Response and Strategy. Furthermore, in 2017 the Nigerian government launched the Economic Recovery and Growth Plan (ERGP), a medium-term development initiative emphasising green growth through, among other instruments, issuing green bonds aligned with its NDC objectives. These institutional arrangements provided investors assurance regarding continuity of its NDC commitment implementation irrespective of political volatility.

3.7 A lack of strong pipelines of meaningfully sized projects

To address their lack of technical expertise required to manage sustainable finance projects, the Nigerian authorities, with support from FSDAfrica and the FMDQ Exchange Group, ensured that human capital needs were met by providing government officials with training – including those outside the debt management office (DMO) – on green bond issuance processes and the management of proceeds. This initiative resulted in the establishment of a clear well-structured project pipeline, which guided the issuance process from identification of viable projects to the allocation of proceeds (FSDAfrica et al., 2022).

The securitised projects in Nigeria had values ranging from NGN 150 million (approximately USD 490,000 in 2017) to NGN 7.8 billion (approximately USD 22 million in 2019), which are well below the thresholds typically required to attract the majority of investors. Therefore, project size did not appear to constitute a significant barrier to green bond issuance in this context.

3.8 A lack of incentives

In both issuances the green bonds were tax-exempt, while no other incentive was provided. Consequently, the absence of guarantees, subsidies or other risk-reducing or investment-supporting measures did not appear to constitute a significant barrier to issuance.

3.9 The debt situation

Driven by the global decline in crude oil prices in 2015-2016, in 2017 Nigeria's public debt had risen compared to previous years. However, the debt to GDP ratio was 24% and many observers held that the country had significant fiscal space for additional borrowing, as this figure remained well below the tolerable threshold. Furthermore, Nigeria's debt levels were considerably lower than the average of those of the SSA countries, which stood at 56.8% (Mbaye et al, 2018). Consequently, despite challenges such as low revenue generation and the Nigerian Naira's exposure to crude oil market volatility, sovereign risk was considered low.

In 2019, Nigeria's debt to GDP ratio had increased to 29%, but remained significantly below the SSA average of 59.6% (Mbaye et al., 2018). However, concerns about Nigeria's debt management began to surface. An article in the Financial Times highlighted issues regarding the use of sovereign bond proceeds, which were reportedly directed to covering budget deficits rather than being invested in infrastructure, industrial development or efforts to diversify the economy away from its heavy dependence on oil. The reliance on oil was particularly problematic, as federal revenue as a share of GDP was alarmingly low at 5.7%, compared to an SSA average of 22% (Wheatley, 2019). Despite these warning signs, the low debt to GDP ratio allowed the Nigerian government to issue two sovereign green bonds that were oversubscribed on both occasions (Policy Development Facility Phase II, 2019).

4. Case study: Seychelles

4.1 Introduction

In October 2018, Seychelles launched its first blue bond valued at USD 15 million. Although the term 'blue bond' denotes a specific focus, these instruments can be regarded as a subset of green bonds, with proceeds exclusively allocated to activities related to the blue economy. According to the Green Bond Principles (GBPs), "Green Bonds are any type of bond instrument where the proceeds will be exclusively applied to finance or re-finance in part or in full new and/or existing eligible Green Projects and which are aligned with the four core components of the GBP" (International Capital Market Association, 2021, p.3). Since the bond issued by Seychelles was aligned with the four core components of the GBPs and its proceeds fund projects falling in the category of 'sustainable management of living natural resources,' it can be categorised as a green bond according to the International Capital Markets Association GBPs.

4.2 A lack of local demand

To overcome the lack of local demand for green bonds, the Seychelles government did not make the bond offering public. Instead, with the assistance of the World Bank, three asset-management firms in Europe and the US were identified as buyers of the Seychelles blue bond. As a result, the issuance was structured as a private placement and excluded other potential investors. This approach also ensured that the bond documentation remained confidential, and the prospectus was not made publicly available (March et al., 2024). Ultimately, the pre-identification of international investors made the lack of local demand an irrelevant barrier.

4.3 Features of the capital market

Prior to issuing the blue bond, the Seychelles government undertook a comprehensive structural reform programme under the guidance of the International Monetary Fund (IMF), which strengthened the country's macroeconomic stability and controlled inflation rates (International Monetary Fund, 2018). By 2018, the Seychelles banking sector was well capitalised and most banks were profitable, while risks of failures were well contained. In addition, with the establishment of its first stock exchange, Seychelles emerged as an international financial centre occupying a notable position in Africa and maintaining strong integration with the global financial system. Furthermore, the country was regarded as having one of the most attractive legal and regulatory environments for company formation (Eastern and Southern Africa Anti-Money Laundering Group, 2018). In conclusion, the characteristics of the country's capital market did not represent a major barrier to the issuance of the blue bond.

4.4 Transaction costs

To cover most of the transaction costs, the Seychelles government secured a donation of USD 425,000 from the Rockefeller Foundation (Benzaken et al., 2024). Consequently, the transaction cost barrier was overcome.

4.5 The risk return profile

Issuing a conventional sovereign bond would have been prohibitively expensive for the Seychelles government as the country was rated below investment grade (Jackson, 2019). In addition, the relatively low diversification of the Seychelles economy created a latent risk for investors. To overcome the risk-return barrier, Seychelles negotiated a USD 5 million loan guarantee from the World Bank and a USD 5 million concessional loan from the Global Environment Facility (GEF). These financial instruments rendered the sovereign transaction economically feasible by reducing the coupon rate from 6.5% to 2.8%, which substantially mitigated the risk of default (Christiansen, 2024). The use of blended finance to subsidise the bond allowed investors to gain confidence in the returns generated by the national economy. Simultaneously, the government was able to extend loans to businesses without incurring significant losses or exceeding its debt targets.

4.6 Institutional arrangements

As it outlined in its first NDC, Seychelles prioritised the blue economy – a sector reliant on healthy marine and coastal ecosystems – as a cornerstone of its climate goals and strategy for economic resilience and growth. Since 2015 Seychelles had demonstrated a strong commitment to the blue economy by establishing a Department for Blue Economy and a dedicated research centre. The Marine Spatial Planning Initiative, an integrated multi-sector approach to address climate change adaptation, protect marine biodiversity and support the blue economy, became the overarching framework for projects funded by the proceeds of the blue bond. This initiative enabled Seychelles to assert its leadership on the global stage and provide investors with clarity and assurance regarding its strategic direction and target outcomes (Schutter and Hicks, 2019).

Moreover, prior to issuing the blue bond, in collaboration with the World Bank, Seychelles implemented macroeconomic reforms to promote good governance, ensure a robust fiscal and regulatory environment, and safeguard private investments, thereby enhancing accountability. The country's successful execution of a debt-for-nature swap (DNS) further demonstrated its commitment to transparency and accountability, which reinforced investors' confidence (Christiansen, 2024). In conclusion, the issuance of the blue bond took place when Seychelles was implementing the necessary reforms to build its credibility as a safe place to invest.

4.7 A lack of strong pipelines of meaningfully sized projects

Of the total USD 15 million raised through the blue bond, USD 3 million was allocated to the Seychelles Conservation and Climate Adaptation Trust's Blue Grants Fund (BGF), while the remaining USD 12 million was designated to capitalise a revolving fund known as the Blue Investment Fund (BIF). The grants allocated by the BGF projects were sized between USD 7,400 and USD 148,100, while those financed by the BIF were worth between USD 10,000 and USD 3 million (March et al., 2024). Consequently, the barrier of project size proved to be insignificant, as both the issuance and the supported projects fell well below international benchmarks. However, it should be noted that the blue bond proceeds would finance projects that are part of a bigger initiative called 'South West Indian Ocean Fisheries Governance and Shared Growth Program' (SWIOFish3), which is worth USD 25 million and managed by the World Bank.

4.8 A lack of incentives

The Seychelles blue bond was sustained by two main incentives: a USD 5 million concessional loan from the GEF, which partially covered its interest payments, and a USD 5 million loan guarantee from the World Bank designed to provide coverage in the event of a default on a scheduled principal payment.

4.9 The debt situation

In 2018, the Seychelles debt-to-GDP ratio stood at 57%, reflecting a significant decline from 192% in 2008 following implementation of economic reforms overseen by the International Monetary Fund (International Monetary Fund, 2018). Furthermore, a DNS for marine conservation and climate change adaptation worth USD 21.6 million that was negotiated with the Paris Club in 2017 had further led to a reduction of approximately USD 1.4 million, which demonstrated to investors the financial management capacity of the Seychelles (March et al., 2024). As a result, the debt situation of Seychelles did not constitute a barrier to the issuance of the blue bond. Instead, the bond issuance benefited from the positive precedent set by the earlier DNS initiative.

5. A comparative analysis of the two case studies

Following the identification and analysis of the barriers that the literature characterises as primary constraints on green bond issuance in SSA emerging markets, this study has examined the cases of Nigeria and Seychelles, two SSA nations that successfully executed green bond issuances. The case study analyses aimed to identify the strategies with which the two states addressed the previously identified challenges, while also assessing which theoretical barriers proved less significant in practice. The following table summarises the findings from the two case studies to facilitate a comparative analysis. On the left, the table lists the barriers encountered during the issuance of green bonds. On the right, the two columns detail the strategies employed by Nigeria and Seychelles to overcome these barriers and highlight the barriers that proved less relevant than expected.

How the barrier was overcome or proved irrelevant

	Nigeria	Seychelles
A lack of local demand	Overcome thanks to collaboration with international organisations and NGOs.	Became irrelevant by striking a private deal.
Features of the capital market	Irrelevant. The outlook of the capital market was not positive.	Overcome by the positive outlook reached after reforms implemented under the guidance of the IMF and the successful DNS.
Transaction costs	Overcome because covered by donors.	Overcome because covered by donors.
Risk return profile	Irrelevant. The YTM of the green bond was aligned with the YTM of the sovereign vanilla bond. No action was taken to make the risk return profile of the green issuance more appealing.	Overcome thanks to a guarantee from the World Bank and a concessional loan provided by the GEF.
Institutional arrangements	Overcome by implementing strong climate and environmental policies and a sound framework for the management of green bonds.	Overcome by showing clarity and certainty on the pathway and the targets to be met in the blue economy, while the recent DNS showcased transparency and accountability.

A lack of strong pipelines of meaningfully sized projects	Irrelevant. The value of the projects was below the threshold that makes green sovereign issuances appealing to most investors.	Irrelevant. The projects had a size far below the international standard to attract investors.
A lack of incentives	Easily overcome. The only incentive provided was tax-exemption of the green bonds.	Overcome thanks to a guarantee from the World Bank and a concessional loan provided by the GEF.
Debt situation	Overcome thanks to a low debt to GDP ratio and a (perceived) low sovereign risk.	Overcome thanks to the capacity of the country to reduce its debt by 135 percentage points in the previous 10 years, thereby increasing its fiscal capacity.

6. Policy implications

6.1 For potential issuers

The analysis indicates that successful sovereign green bond issuances by SSA nations are contingent on three fundamental prerequisites:

- Engagement with or support from international organisations, non-governmental entities and green bond issuance specialists;
- Access to donor funding for transaction costs;
- Manageable debt levels and a favourable sovereign risk assessment.

Having satisfied these prerequisites, the initial step is the establishment of robust climate and environmental policy frameworks clearly aligned with NDC targets to ensure that policy and political volatility do not compromise the implementation of green bond-funded projects. The case studies show the possibility of following two pathways after meeting the three fundamental conditions and establishing robust climate and environmental policies.

As Nigeria shows, the country can mobilise domestic institutional and retail investors by issuing a sovereign green bond denominated in local currency. In this scenario, the size of the projects and the bond issuance are less significant barriers. Similarly, the characteristics of the capital market and the risk-return profile are not critical obstacles, provided that the necessary market infrastructure exists and the yield to maturity (YTM) of the green bond is aligned with that of conventional sovereign bonds. Basic incentives, such as tax exemptions, are typically sufficient to make the bonds attractive to local investors. However, given the potential lack of resources to conduct awareness raising activities, this barrier must be addressed through the involvement of international organisations, NGOs or other stakeholders.

Conversely, the Seychelles case illustrates the possibility of accessing international markets by issuing green bonds in foreign currencies (e.g. EUR or USD). In this case, the analysis suggests that private placement deals mediated by international organisations are more likely to succeed than public offerings. In this scenario, the size of the issuance and a lack of local demand are unlikely to pose significant challenges. However, a positive capital market outlook seems to be crucial to attract and reassure international investors. In addition, the provision of incentives such as concessional finance from international organisations can further reduce the risk-return profile of the bond, making it more appealing to foreign investors.

In conclusion, the study has identified three fundamental prerequisites needed for SSA countries to successfully issue a sovereign green bond. The current regional economic and political environment presents significant impediments to meeting these conditions, which potentially explains why green bond issuances only took place in a few states (9 out of 49) and sovereign green bond issuances in even fewer (2 out of 49). It is significant to note that no SSA country has undertaken a public offering of a sovereign green bond on international markets denominated in foreign currency. This gap indicates a need for further research to understand the barriers preventing such issuances and to explore potential solutions.

6.2 For the European Union

The European Union's Global Green Bond Initiative (GGBI) launched in 2023 establishes a coalition of development finance institutions (DFIs) with three primary objectives:

- to mobilise capital from institutional investors to finance – with green bonds – their climate and environmental projects;
- to increase and diversify their access to private capital for an inclusive and sustainable transition in which no one is left behind;
- to develop credible green bond frameworks.

The target countries for this initiative include several SSA nations, specifically Benin, Côte d'Ivoire, Ghana, Kenya, Namibia, Nigeria, Rwanda, Senegal, South Africa and Uganda.

While the GGBI is a commendable effort, the EU should consider the specific barriers that have previously hindered these countries from issuing sovereign green bonds. In particular, the EU should not only develop credible green bond frameworks but also support local governments in developing strong climate and environmental policies. As the analysis has indicated, investors are often concerned that political instability or shifts in emerging markets could result in suspension or breach of financial agreements. While this perception does not reflect the reality of many SSA countries, it remains a significant factor in investment decisions. Strong climate and environmental policies coupled with a reliable framework for green bond management are essential to reassure investors of a country's commitment to pursuing green projects regardless of political changes.

Furthermore, European DFIs should provide financial support to cover the transaction costs associated with green bond issuance in these countries. As has been demonstrated in the case studies of Nigeria and Seychelles, public finances in SSA countries are often insufficient to cover the technical and administrative expenses required for such issuances. The grants envisaged in the GGBI should be utilised to offset these costs. Otherwise, SSA countries may find it impossible to issue green bonds.

Finally, the EU should consider the features of the countries' capital markets. Based on these characteristics and the ultimate risk-return profile of the green bond, the EU should offer tailored advice on the optimal issuance strategy. This includes guidance on whether the country should pursue a private placement with investors or tap into public capital markets, and whether to issue the bond in local or international currency.

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